REMARKS

This paper is responsive to the non-final Office Action of September 22, 2009. Reconsideration and allowance of claims 1-9 and 11-21 are requested.

The Office Action

Claims 1-3, 5, 7, 8, and 11 stand rejected under 35 U.S.C. § 103 over Argiro (US 5,986,662) as modified by Kaufman (US 2004/0125103), as further modified by Buhler (US 2003/0160788).

Claims 4, 6, 9, and 12 were indicated as containing allowable subject matter.

Claim 13 stands rejected under 35 U.S.C. § 101 and under 35 U.S.C. § 103 over Argiro as modified by Kaufman, as further modified by Buhler.

Claim 14 stands rejected under 35 U.S.C. § 101 and under 35 U.S.C. § 103 over Argiro as modified by Kaufman.

Claims 15-20 stand rejected under 35 U.S.C. § 101. Because claims 15-20 do not stand rejected on art, it is understood that these claims contain allowable subject matter and will be allowed once the 35 U.S.C. § 101 issues are satisfactorily resolved.

The Claims Distinguish Patentably Over the References of Record

The Examiner acknowledges that Argiro and Kaufman fail to teach selecting one of a plurality of rendering algorithms and/or rendering parameters in dependence on the ray position. The selected one of the plurality of rendering algorithms and/or rendering parameters changes with the ray position. Buhler does not cure this shortcoming of Argiro and Kaufman.

Paragraph [0047] of Buhler, referenced by the Examiner, does not address either selecting one of a plurality of rendering algorithms and/or rendering parameters in dependence on ray position. Nor does this paragraph of Buhler disclose or teach that the selected one of the plurality of rendering algorithms and/or parameters should change with ray position. Rather, paragraph [0047] merely suggests that the rays be cast in a divergent bundle. Paragraph [0015] of Buhler,

referenced by the Examiner, also fails to cure this shortcoming. Rather, paragraph [0015] of Buhler is a paragraph of general background discussing the method of rendering that is referred to as "ray tracing". This paragraph does not suggest selecting a different ray tracing algorithm or parameter in dependence on ray position, much less that the selected algorithm or parameter change with ray position.

Paragraphs [0017] and [0018] of Buhler indicate that there are a number of methods known for eliminating visual artifacts relating to large sampling intervals. However, it is clear from Buhler that whichever method is selected, the selected method is used for every ray. The method is not selected in dependence on ray position nor does it change from ray to ray.

Paragraph [0022] of Buhler, as general background, provides a brief description of "ray casting".

Because Buhler does not cure the acknowledged shortcomings of Argiro and Kaufman, it is submitted that claim 1 and claims 2-5, 7-9, 11, and 12 dependent therefrom distinguish patentably and unobviously over the references of record.

The allowance of claim 6 is acknowledged with appreciation.

Claim 13 has been amended to address the 35 U.S.C. § 101 issues. Specifically, claim 13 has been amended to limit it to a tangible computer readable storage medium. It is submitted that with this amendment, it is clear that claim 13 is now directed to a tangible statutory article of manufacture.

Claim 13 calls for a plurality of different rendering algorithms to be used to generate the pixels of the 2D image. The Examiner acknowledges that Argiro as modified by Kaufman does not teach this limitation.

Buhler does not cure this shortcoming of Argiro and Kaufman.

Paragraph [0022] of Buhler, referenced by the Examiner, gives an overview of the ray casting method. Particularly, in ray casting, each ray advances from the perspective of the viewer. As it advances, tests are made to determine whether the ray has collided with an object. It is submitted that as described in paragraph [0022] of Buhler, every ray is advanced similarly and tested using the same test parameters. Paragraph [0022] does not suggest using a plurality of different rendering algorithms/parameters in order to generate the pixel values of one 2D

image. Rather, it is submitted, that paragraph [0022] of Buhler teaches that the same rendering algorithm/parameter should be used to generate every pixel value of the 2D image. Paragraph [0047] describes a ray bundle casting technique in which a bundle of rays are cast. There is no suggestion in paragraph [0047] that any of the rays of the bundle are rendered using different algorithms/parameters. Again, it is submitted that all rays of the bundle are cast using the same algorithm and parameter when generating a given image.

Accordingly, it is submitted that claim 13 distinguishes patentably and unobviously over the references of record.

Claim 14 was initially rejected based on Argiro as modified by Kaufman, but was amended in the amendment of March 23, 2009. In the Notice of Allowance of June 15, 2009, the Examiner held that claim 14 distinguishes patentably over Argiro as modified by Kaufman. The Examiner's reasons for now rejecting claim 14, which was presented in the exact same form as when it was allowed, fail to address why it should now be rejected based on the same references over which the Examiner had previously agreed that it defined patentably.

Argiro and Kaufman are not properly combined. Argiro at column 3, lines 1-8 describes the cast rays as projecting perpendicular from each pixel in the picture plane, i.e., the rays extend parallel to each other. When the rays extend parallel to each other, the scale of the 2D image is substantially the same as the scale of the 3D volume.

By contrast, Kaufman projects the rays along divergent paths to generate a view fulcrum 168 [0253]. These divergent rays result in minification. That is, as the rays go deeper and deeper into the 3D volume, they diverge further and further as shown in Figure 24 of Kaufman. These divergent rays result in minification in which with greater divergence, larger planes are depicted in a given size 2D image with a scale that is progressively reduced with divergence than that of the corresponding portion of the 3D volume.

The portions of Kaufman which the Examiner is applying deal with Kaufman's solution to the problem of diverging rays. However, because Argiro has parallel rays, Argiro does not have the problem addressed by Kaufman. Because Kaufman corrects a problem which Argiro does not have, it is submitted that there

would be no motivation to add the divergent ray correction of Kaufman to the parallel ray technique of Argiro.

On page 17 of the Office Action, the Examiner paraphrases language which he concedes Argiro fails to teach. However, the paraphrased language comes from claim 14 as originally filed. The paraphrased language was changed in the amendment of March 23, 2009. Accordingly, it appears that the Examiner is not basing his application of the references on current claim 14.

Claim 14 calls for selecting one of a plurality of rendering algorithms/parameters in dependence on (1) the ray position and (2) the anatomical region of the patient represented by the ray position, and (3) a medical or clinical situation. The rejection of claim 14 fails to address this language or assert where it may be found in Argiro or Kaufman, much less why Argiro as modified by Kaufman would teach such language.

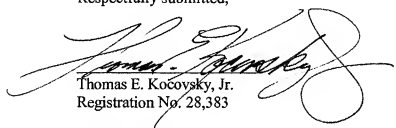
Claim 14 complies with the requirements of 35 U.S.C. § 101 in that it sets forth a transformative step. Particularly, the 2D image is displayed or stored. Nonetheless, claim 14 has been amended to tie the steps more closely to hardware. It is submitted that claim 14 now, even more clearly, complies with the requirements of 35 U.S.C. § 101.

Accordingly, it is submitted that claim 14 and claims 15-21 dependent therefrom distinguish patentably and unobviously over the references of record and comply with the requirements of 35 U.S.C. § 101.

CONCLUSION

For the reasons set forth above, it is submitted that claims 1-9 and 11-21 distinguish patentably and unobviously over the references of record and comply with 35 U.S.C. § 101. An early allowance of all claims is requested.

Respectfully submitted,



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